Modoc National Wildlife Refuge
Annual Narrative
2004

Reviewed and Approved by:

_____ _____

Project Leader, Modoc NWR Date

Introduction

Fed by snowmelt from the Warner Mountains, the Pit River creates an oasis for wildlife in the high desert of northeastern California—Modoc National Wildlife Refuge. The Refuge was established in 1961 to manage and protect migratory waterfowl. Funds available under the Migratory Bird Duck Stamp Program helped purchase this Refuge. The 7,021 acre Refuge is located along the south fork of the Pit River in Modoc County, just south of the town of Alturas in extreme Northeastern California. The Refuge is bordered on the east by the Warner Mountains and on the west by the Adin Mountains. The Warner Mountain range rises to an impressive average elevation of 8,000 feet and contains extensive stands of ponderosa pine and white fir trees. This mountain range is also the principal watershed for the entire Pit River Valley west of it, which includes the Refuge. The landscape surrounding the Refuge includes rolling hills, canyons and plateaus with a sagebrush and juniper vegetative community.

Several habitat types are represented on Modoc NWR including freshwater lakes and ponds, irrigated meadows, croplands, natural flood plains, marsh communities, riparian corridors and sagebrush and juniper uplands. Soil types are mostly heavy clays having a high alkalinity. Black alkali surrounded by salt concentrations is not uncommon on the poorly drained areas of the Refuge.

Modoc NWR is one in a chain of National Wildlife Refuges along the Pacific Flyway extending from Alaska to Mexico. The Refuge is part of a larger complex of mid-altitude wetlands and lakes of Northeastern California and strategically situated as an important resting and feeding area for migratory birds. Permanent ponds, seasonal marshes and wet meadows attract thousands of waterfowl, shorebirds, raptors and songbirds to the Refuge as they make their journeys between nesting and wintering grounds along the Pacific Flyway. Modoc County acts as a migration hub and staging area for ducks, geese and other wetland birds on their southward migration that funnels into this region, which is 60 miles east of the Klamath Basin marshes. After feeding and resting on the Refuge, they continue to the Central and Imperial Valleys of California and other wintering areas. This pattern is reversed in the spring. The Refuge's wetlands and adjacent uplands are also an important nesting area for more than 76 species of ducks, geese, greater sandhill cranes and several other species of marsh birds. In total, more than 250 species of birds have been documented on the Refuge. In addition to bird species, the diverse habitats on the Refuge support a wide range of mammals, reptiles, amphibians, insects and plant life.

Modoc is one of over 500 refuges in the National Wildlife Refuge System — a network of lands set aside specifically to conserve fish, wildlife and plants. Managed by the U.S. Fish & Wildlife Service, the System is a living heritage, conserving wildlife and habitat for people today and for generations to come.

Table of Contents

A. HIGHLIGHTS

- Rehabilitated waterfowl islands in Duck and Fluornoy Ponds (Section F.2).
- Completed office renovation by converting garage into additional offices (Section I.1).
- The Final Modoc National Wildlife Refuge Fire Management Plan was completed (Section F.9).
- Completed renovation and garage addition to headquarters residence.
- Rehabilitated waterfowl islands Little Goose Pond (Section F.2).
- Completed rehabilitation to Railroad/Gadwall ponds (Section I .2).
- Completed Phase I Grandma Tract wetland restoration project (Section I.2).
- Completed renovation and garage addition to headquarters residence (Section I.3).
- Completed Canada goose collaring program (Section G.3.b).
- Completed one Partners for Fish and Wildlife wetland restoration project (Section F.15).
- Initiated Wildland Urban Interface (WUI) juniper thinning project at Subheadquarters and Dorris Reservoir (Section).

B. CLIMATIC CONDITIONS

The Refuge has a semi-arid climate with dry, hot summers and cold winters. Summer temperatures can occasionally reach 100 degrees Fahrenheit (°F), but generally cool rapidly during the evening and night time hours. Night time temperatures can dip below 32°F during the summer months. January is the coldest month of the year, with temperatures occasionally dropping below 0°F. Daytime temperatures during January often exceed 40°F. Frost can, and usually does, occur in every month. Strong winds are common, especially during winter months. Precipitation generally occurs during the winter and spring months, with the Refuge receiving approximately 7-12 inches of rainfall annually.

The Refuge was anticipating a meager spring runoff due to a paucity of precipitation during the winter months in 2002-2003, but a wet spring filled Dorris reservoir to capacity. The year progressed with typical temperature regimes and near normal precipitation. By the end of the year substantial snow pack had accumulated in the Warner Mountains and the Refuge was anticipating a high spring runoff.

Table 1 shows the summary of climatic conditions for Alturas during calendar year 2003.

Table 1: Summary of Climatic Conditions in Calendar Year 2003 at Alturas Ranger Station

Month	Avg. Min. Temp. in F°	Avg. Max. Temp. in F°	Avg. Temp. in F°	Total Precip. (inches)	Avg. Precip. (inches)
January	40.84	33.74	48.06	1.04	1.51
February	35.7	26.5	54.29	0.59	1.27
March	41.2	32.55	50.32	1.69	1.37
April	38.4	30.37	46.53	1.85	1.07
May	53.26	40.94	65.48	1.22	1.30
June	65.47	50.40	80.87	0.10	0.95
July	74.06	58.90	89.35	0.08	0.29
August	67.87	53.65	82.06	0.90	0.34
September	66.00	50.43	81.67	0.40	0.48
October	56.61	42.35	70.94	0.00	0.93
November	35.83	28.23	43.47	1.68	1.45
December	33.93	28.57	39.50	2.97	1.51
Total	n/a	n/a	n/a	12.52	12.46

C. Land Acquisition

1. Fee Title

In 2004 the Refuge was approached by the owners of an adjacent parcel, known as Bert's Autobody, with an offer to sell. This 2 acre parcel is surrounded by Refuge and sits along the County road just outside the Refuge entrance gate. Though of little habitat value, this parcel has long been an eyesore. When it was learned that the local Rancheria/Casino was interested in buying the parcel to build a gas station and convenience store our interest in acquisition rose dramatically. A contaminants survey of the property was completed late in 2004 and as we go into the new year we are still waiting on the final report before the acquisition process can proceed any further.

3. Other

NTR

4. Farmers Home Administration Conservation Easements

NTR

D. PLANNING

3. Public Participation

One meeting of the Refuge Hunting Working Group was held during the year. The group met in November and were given updates on waterfowl production, banding projects, and habitat work completed earlier in the year. The group provided input to staff on the ongoing hunt season and possible future projects.

4. Compliance with Environmental and Cultural Resource Mandates

The following was undertaken at Modoc NWR in the year 2004 to meet with cultural resource mandates:

- Cultural clearance for wetland restoration in the Headquarters wetlands unit;
- Cultural clearance for mechanical firebreak clearing around the Alturas Rancheria inholding;
- State Water Quality Control Board certification for Davis FSA easement wetland restoration.

5. Research and Investigations

Approximately 4,000 to 5,000 Canada geese (CAGO) utilize Modoc National Wildlife Refuge (Modoc NWR) throughout the year. An average of 506 pairs produced an average 1,390 CAGO year^{-1} from 1972 – 2002. Questions regarding CAGO breeding bird habitat utilization and distribution and post brood rearing dispersal and subsequent spring arrival dates within Modoc NWR and adjacent northeast California lands remain unanswered. Previous studies completed by California Department of Fish and Game noted that spring CAGO sightings on Modoc were dominated by birds collared while molting at Goose Lake, north of Modoc, but it was not determined that those birds necessarily nested at Modoc. That particular study also pointed out there is uncertainty about how much time the various flocks of CAGO spend on wintering grounds away from the northeastern part of the state.

In 2003, a visible neck collar program was implemented in order to determine local habitat use and distribution and dispersal and arrival within Modoc NWR and adjacent habitat in northeastern California. In June, 143 CAGO were collared and banded and

13 additional CAGO were leg banded only. Leg banding alone would not completely provide the required information due to low band return data. Moreover, due to their visibility, neck collars have the potential to provide multiple return data over time. The collaring portion of the study will continue through 2004. The objectives of the CAGO collaring program were to:

1. Determine site-specific habitat utilization and distribution information within Modoc NWR and adjacent habitats in northeastern California.
2. Determine Modoc breeding CAGO dispersal (post brood rearing) and subsequent arrival time to and from Modoc NWR.

Greater sandhill crane banding and monitoring efforts were continued with 48 breeding pairs and 39 nests located and 22 cranes captured and banded.

Waterfowl banding continued on the Refuge this year through the use of baited traps and airboat capture. In August and September, 189 ducks were banded.

The Mapping Avian Productivity and Survivorship (MAPS) program was fully operational in 2003. MAPS operated eight days from June through August when 236 neotropical migrants comprised of 22 species were mist netted and banded.

E. ADMINISTRATION

1. Personnel

Personnel at Modoc NWR during the calendar year 2004 included (from left to right in photo):

Greg Albertson - Engineering Equipment Operator, WG-9, Perm. full-time, EOD- 3/93
Carl Cox - Gardener, WG-4, Seasonal Temp., EOD-4/02
Shannon Ludwig - Wildlife Biologist, GS-11, Perm. full-time, EOD-7/02
Bradley Storm - Engineering Equipment Operator, WG-9, Perm. full-time, EOD-9/88
Steve Clay - Refuge Manager/Project Leader, GS-12, Perm. full-time, EOD-10/01
Alicia Winters - Administrative Assistant, GS-6, Perm. full-time, EOD-5/02

Table 2: Staffing Levels at Modoc NWR from 2002 to 2004

Year	Full-Time	Part-Time	Temporary
2002	5*		
2003	5		2
2004	5		3

*only through a portion of the year

2. Youth Programs

Our YCC program, which operated from June 17 through August 9 and involved young adults from the local area, accomplished many tasks for the Refuge this year. The crew consisted of six enrollees and a crew leader. One participant did not finish the program due to a serious illness in the family. Some of the projects included constructing the ADA hunting blind, fence removal and converting boundary fences into wildlife friendly fences, staining water monitoring structures, hunter kiosk and sign repairs and thistle control.

The total number of hours worked by the participants, not counting the crew leader, were 1,551 man hours. Out of the total hours worked, 143 man hours were spent in formal education on topics ranging from the histories of Modoc NWR and Sheldon NWR, wetlands ecology and management, general ecology and conservation, wildlife management, insect collection and identification, and bird identification, including searching for greater sandhill crane colts. A total of 28.5 man hours were spent on recreational activities including swimming and a barbecue. The remaining 1,379.5 man hours were spent on numerous labor intensive projects detailed in Table 3.

Table 3: Youth Conservation Corps Projects and Man Hours at Modoc NWR

Project	Man Hours
Noxious Weed Control	102
Fence Removal	333
Fence Removal, Sheldon NWR	78
Post Removal	131
ADA Hunting Blind Construction	164
Refuge Boundary Sign Replacement	34
Refuge Sign Maintenance	25
Kiosk and Bathroom Maintenance	137

Trailer Maintenance	33
Fence Building	79
Improvements Around Headquarters	241
General Maintenance	23

The YCC participants were encouraged to be aware of the purposes and goals of each project and how it related to the successful management of the Refuge. The program was very successful because it not only provided a means to complete a large amount of refuge projects but it also provided the YCC participants with an awareness of the Refuge and the Refuge System.


YCC Enrollees fastening the plywood to the frame


Completed ADA Hunt Blind

4. Volunteer Program

The volunteer program operated on a limited basis in 2002 when only one project was completed. A local high school student elected to complete his Eagle Scout project with Modoc NWR. The project entailed an inventory and repair/maintenance of bird house boxes along the tour route and in the headquarters and Sub-headquarters area. Approximately 93 man-hours were spent repairing and maintaining 54 bird nest boxes.

5. Funding

The following table outlines funding for the Refuge over the past three years.

Subactivity	2002	2003	2004
1121	$10,500	$45,250	$12,800
1261-base	$313,789	$351,203	$364,954
1261-CCS		$30,500	$64,500
1262 – Ann. Maint.	$30,000	$40,726	$54,960
1262 – MMS	$168,513	*$266,370	*347,014

* Includes Rental , YCC, and SAMMS funds

6. Safety

Safety meetings were held every month throughout the year with a variety of topics discussed. There were no vehicle accidents to report for the year. Annual walk around inspection of all facilities was completed. Minor safety issues brought to our attention from our regional safety personnel were corrected or will be as funds permit. Annual service was completed for all fire extinguishers. Topics discussed during staff safety meetings included; Pesticide handling, winter/ defensive driving, proper lifting/office safety, anti-lock brakes, and heat stroke/ dehydration. Quarterly and annual water samples were taken throughout the year. The Hamilton domestic well had to be chlorinated do to a high coliform count on one of the quarterly samples. A fire rated storage cabinet was installed in the shop.

7. Technical Assistance

In 2002, technical assistance was given to Central Modoc Resource Conservation District (CMRCD) with riparian restoration and wetland design on several local private lands projects within the Pit River watershed. The Refuge also assisted the CMRCD during a riparian restoration workshop by providing a project site in the Godfrey Tract. During the workshop, the Refuge also provided equipment and manpower to complete several riparian restoration design techniques in which a 300 foot reach of the Pit River bank was rehabilitated.

The Refuge assisted the Natural Resource Conservation Service (NRCS) with a Wetland Reserve Program (WRP) assessment on a completed WRP project on a ranch in MacArthur, CA.

The Refuge also assisted the NRCS on a WRP evaluation in Lookout, CA where the Refuge served as the Fish and Wildlife Service official representative to determine if the project would meet the WRP criteria.

8. Other

A Refuge Revenue Sharing check in the amount of $24,820.00was issued to Modoc County on June 23, 2004.

F. HABITAT MANAGEMENT

1. General

Although some refuges are undisturbed wilderness areas, most are actively managed to provide food, water and shelter for wildlife. Utilizing a variety of techniques, managers of national wildlife refuges restore and enhance lands and waters to increase their value to wildlife.

The Pit River watershed is located in northeastern California, at the western edge of the Great Basin Province. The headwaters are drained by the North and South Fork of the Pit River. The North Fork of the Pit River originates at the outlet of Goose Lake, an enclosed basin, and the South Fork of the Pit River originates from several tributaries in the south Warner Mountains. The confluence of both forks is located south of Alturas, where the mainstem Pit then flows southwesterly to Shasta Lake in Shasta County, and eventually into the Sacramento River and the Bay Delta of San Francisco Bay. In all, there are 21 named tributaries, totaling approximately 1,050 miles of perennial stream and encompassing 4,324 miles.

Refuge wetlands are maintained by a complex and extensive irrigation system to allow for flooding and draining of various habitats. Water is conveyed through a system consisting of an 11,400 acre foot storage reservoir (Dorris Reservoir), 20 miles of major canals, 50 miles of minor ditches, the South Fork of the Pit River and several pond and marsh units. This system provides water for all the wetland areas on the Refuge and is managed to produce the maximum benefits for wildlife and habitat. Planned annual operations include maintaining appropriate water levels throughout the system while supplying a continuous flow of fresh water.

The Refuge receives water from the South Fork of the Pit River, Pine Creek direct diversion and Pine Creek and Parker Creek storage into Dorris Reservoir. The South Fork of the Pit River flows through the Refuge and provides riparian flood water to wetlands and riparian areas on the west side of the Refuge including the Sharkey Field, North and South Grain Fields, Matney Fields, Pit Marsh, Matney Marsh, 395 Ponds and the South Dam Pond. Pine Creek direct diversion provides water to the Hamilton Tract and Pine Creek Field. Storage water in Dorris reservoir provides water to the remaining wetlands, meadows and ponds within the Refuge.

No major projects were completed within the water delivery system of the Refuge in 2002 other than general annual maintenance. At Modoc NWR, several habitat management techniques were utilized in the year 2002 and are described throughout the text that follows.

2. Wetlands

Wetlands are among the most productive habitats in the world for fish, wildlife and humans. To birds, not all wetlands are created equal. Some prefer deep

water for fishing; others prefer warmer, shallow water with its wealth of aquatic plants and insects; some simply need a mere inch or two of water to probe for invertebrates in recently exposed mud.

In the arid West, water has always been a valuable commodity to all forms of life. Water and wetland habitat are the keys to attracting migratory birds and other wildlife in this high desert area. But as human use of water has grown, the amount remaining for wildlife continues to diminish. At one time, the State of California had over 4 million acres of wetland habitat. Today, less than five percent remains. The practice of draining wetlands and diverting streams to other uses, which began in the late 19th century, has made these precious resources far less common in the arid West. Modoc NWR contained limited wetland habitats when originally acquired. The marshy character of the area had been altered by agricultural drainage, particularly along the South Fork of the Pit River. Wetlands within the Refuge have been restored over time to provide valuable wildlife habitat.

Water is key to attracting waterfowl in this high desert area. Balancing human consumption with wildlife needs requires careful water conservation and management strategies. The staff uses the Refuge's elaborate water control system to fill or drain permanent ponds and seasonal marshes to meet the needs of many wildlife species simultaneously. Planned annual operations include maintaining non-fluctuating water levels throughout the system while supplying a continuous flow of fresh water.

Dorris Reservoir recharged to almost full capacity by the beginning of irrigation season, so water quantity was not as much an issue as in the prior year when a severe deficit occurred. Maintenance staff did an excellent job of meticulously monitoring and maintaining the water levels in the wetlands, ponds and wet meadows. No significant habitat areas in the system were unintentionally dry. Teal pond was dried down in order to rehabilitate the waterfowl islands within the system. All of the islands were scraped down to an elevation ranging from 1 foot to 3 feet above the normal high water mark to create more useable loafing and nesting islands. Five nesting islands were reinforced with rip-rap. The rip-rap held the islands together very well by decreasing erosion but limited the use by most waterfowl except geese. It is presumed that over time the rip-rap will fill in with sediment and create a more suitable substrate for ducks.

Ample water flowed through the South Fork of the Pit River to maintain the wetlands dependent on this water source, as well as allow the majority of the water features in the hunt area to be near full capacity or flooded in time for the opening of hunting season. Precipitation during the winter of 2002 was very below normal which left Dorris in a deficit by the end of the year.

The South Grain Field (120 acres) was taken out of grain, disced and subsequently flooded in the fall and converted into a moist soil management. The management of the unit will consist of spring draw-down and fall flooding to encourage the growth of desirable annuals such as smartweed.

4. Croplands

The farming program at Modoc NWR is conducted entirely by force account and is intended to provide a high energy food source, such as barley and wheat grain, for waterfowl and greater sandhill cranes during migration. Also throughout the year, these planted fields help to avoid waterfowl depredation on adjacent, private farm lands. This year a total of approximately 325 acres of Refuge lands were planted with grain. Approximately 107 acres were planted with spring barley in the Grandma field (50 ac.), Unit #1 in the Hamilton Tract (28 ac.), and Matney fields #1 (3 ac.), #2 (3 ac.), and #3 (23 ac.). Approximately 112 acres were planted with winter wheat in the North Grain Field (80 ac.) and Matney fields #5 (10 ac.) and #6 (22 ac.). A total of 106 acres were planted with rye in the Town field (80 ac.) and Matney #9 (26 ac.). All grain was planted at a rate of approximately 60 to 65 pounds per acre. Although grain production was excellent in the North Grain Field, the remainder of the fields did not produce very well. Despite the poor grain yield, the farmed fields were used by waterfowl, cranes and other wildlife.

6. Other Habitats

Six habitat types are found at Modoc NWR – upland, wet meadow, freshwater lakes/permanent ponds, fresh emergent wetlands/seasonal marsh, woody riparian and farmed grain fields. Together, these habitat types cover approximately 7,011 acres of Refuge land, with the remaining 10 acres classified as administrative sites. Table 4 shows estimated acreage by habitat type in the Refuge.

Table 4: Estimated Acreage by Habitat Type on the Modoc National Wildlife Refuge

Habitat Type	***Total Refuge Acres***
Upland - grass or shrub land	1,514
Wet Meadow	3,485
Freshwater lakes/Permanent Ponds	1,000
Fresh Emergent Wetlands/Seasonal Marsh	200
Woody Riparian	246
Farmed Grain Fields (dry land)	566
Administrative Site	10
Total Acres	7,021

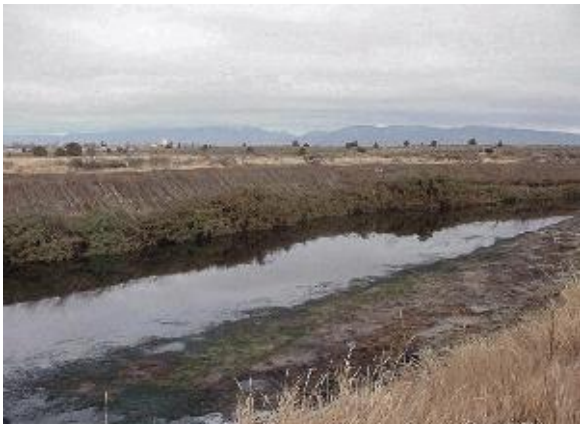
Small, but important, riparian areas on the Refuge provide erosion control by regulating sediment transport and distribution, enhance water quality and produce organic matter for aquatic habitats. They also provide wildlife habitat for mammals, raptors, woodpeckers and neotropical migrants such as warblers, swallows, flycatchers and sparrows. Riparian areas are among the most diverse, dynamic and complex biological systems, and contribute significantly to our regional biodiversity.

The riparian area associated with Pine Creek that passes through the Refuge has been in a non-use status since 1983 when cattle grazing in the area was eliminated. Planted and previously existing willow trees, narrow-leaf cottonwood trees and wild rosebushes continue to thrive and provide excellent cover for wildlife. Additionally, the riparian area at the Sub-headquarters unit remains in non-use status with planted and previously existing trees thriving.

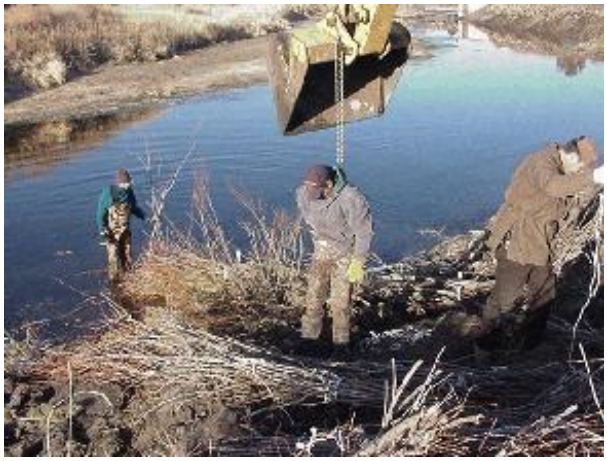
No significant management activities or improvements occurred within woody riparian areas of the Refuge in the calendar year 2002.

Non-woody riparian habitat exists along the Pit River in narrow bands and contributes to stream bank stabilization and flood attenuation. The vegetation is mostly comprised of reed canary grass and several species of rushes and sedges. Much of the Pit River stream bank has been vertically down-cut over time due to changes within the landscape including loss of riparian vegetation, agriculture, grazing, upstream channelization and ditching, and altered natural flow regimes. Much of the down-cutting and degradation occurs along the South Fork portion and along the main stem within the Godfrey Tract.

In cooperation with the Central Modoc Resource Conservation District, a 300 foot reach of the Pit River stream bank in the Godfrey Tract was rehabilitated in November. The project served as a test site for a Riparian Ecology and Stream bank Restoration workshop where several bioengineering techniques were employed to reinforce the stream bank. The project entailed cutting the stream bank back to a 4:1 and 2:1 slope and: 1) reinforcing the slope toe with juniper revetment and 2) reinforcing the bank with brush barbs, brush mattresses, vertical willow fascines, or willow plantings. The project will be monitored and assessed during 2003.



Pit River stream bank rehabilitation November, 2002.



The East Ebbe and Grandma Field were surveyed for habitat restoration by Ducks Unlimited. Both fields have historical wetland components but were converted to fields/pastures which exhibit more upland components. The restoration plan includes the detailed survey and reintroducing hydrology to the units. The fields would then be managed as more of a wet meadow and serve primarily as greater sandhill crane and waterfowl habitat.

a. Wet Meadows

These communities typically exhibit shallow surface water or saturated soil conditions. Wet meadows occur over most of the Refuge and are associated with its developed irrigation system. They are dominated by

herbaceous plants, including Baltic rush, a variety of sedges and other rushes and Reed canary grass.

Modoc NWR has approximately 3,500 acres of grasslands that are managed for greater sandhill crane and waterfowl production. Approximately 2/3 of these grasslands are irrigated and managed as wet, short-grass meadows that provide succulent green browse for Canada geese and nesting and foraging habitat for greater sandhill cranes, rails, common snipes and Wilson's phalaropes. Ducks also utilize these irrigated fields as foraging areas during spring migration and, to a lesser extent, for nesting purposes. A late-season haying program is conducted on a portion of these fields to provide an effective and economic tool that encourages green browse and nesting and foraging habitat. Depending on the post-haying growth, some of these fields are also grazed following the removal of hay in August. All of the hayed/grazed fields are typically flooded in the spring (April) to provide green browse for geese and foraging habitat for greater sandhill cranes and migrant waterfowl staging within the Refuge. For cranes, these irrigated fields warm sooner than non-hayed fields, providing an abundant food source of invertebrates which are very important to nesting cranes.

Because of ample water in 2002, the maintenance staff was able to irrigate these wet meadows for a successful spring production of green browse and nesting areas.

b. Uplands

These areas are not subject to flooding and do not contain wetland soils. They are dominated primarily by basin big sagebrush, juniper, rabbitbrush and perennial grasses such as Great Basin wild rye interspersed with locally abundant bunchgrasses. As uplands converge upon wetlands along the topographic gradient, bunchgrasses become more dominant as shrubs are less tolerant to more hydric conditions. Uplands are dispersed throughout the Refuge, but the majority are located around Dorris Reservoir and within the Godfrey Tract. Small upland areas are located around the Refuge Headquarters, interspersed among wetland habitats and on the margins of the South Fork of the Pit River. Those upland areas adjacent to wetlands are managed for waterfowl production and are kept undisturbed with no haying or grazing activities. These areas, as well as shrub dominated uplands, also provide excellent habitat and cover for quail, pheasants, deer, rabbits, snakes, kangaroo rats, ground squirrels and several species of songbirds.

This habitat has been modified since settlement. The invasion of cheat grass, an exotic annual favored by frequent burns, provides an accumulation of fine fuels that burn readily and allows the sagebrush grasslands to burn more frequent stand replacing fires. The recent history of fire suppression has allowed unimpeded juniper encroachment. Vegetation changes precipitating modified plant community structure and

composition within the uplands have altered the fire regime and subsequently changed wildlife utilization.

The uplands at Dorris Reservoir are dominated by juniper trees. Due to past and current uses of the Refuge uplands and other private uplands in Modoc County, high quality sage shrub-steppe habitat in this high desert area is becoming less abundant. The Refuge manages these uplands with long-term rest in order to ensure survival of remnant stands of native shrublands and grasslands.

No major management activities occurred within the uplands in 2002, but future juniper removal and native vegetation restoration projects have been proposed.

7. Grazing

In combination with the haying program, the Refuge implements grazing of cattle on certain wet meadows in the late fall/early winter as another effective and economic tool to remove old plants and recycle nutrients. Private ranchers who possess grandfather rights are allowed to graze a predetermined number of head of cattle (measured in Animal Unit Measurements or AUMs) on the Refuge under a Special Use Permit with conditions.

In order to more closely monitor the number of cattle on the Refuge, this year Refuge staff counted and documented the number of cattle as they were placed on or removed from the Refuge. From 2000 to 2002, the following grazing of cattle, reported in AUMs, occurred on Modoc NWR:

Table 5: Summary of Grazing Program at Modoc NWR from 2000-2002

Field	Tons of Hay		
	2000	2001	2002
Bailey	0	91	171 (grazed 10/12-10/23)
Hansen West	0	0	73 (grazed 10/4-11/14)
Hamilton Tract	0	134 (grazed 9/5-11/28)	388 (grazed 10/11-12/17)
Grandma	0	0	155 (grazed 9/30-11/18)
Pine Creek	0	612 (grazed 8/24-11/24)	305 (grazed 9/25-11/22)
South Pine Creek	0	110 (grazed 9/10-10/29)	118 (grazed 9/19-11/15)
Town	0	0	549 (grazed 10/10-11/30)

8. Haying

Meadows are important feeding areas for sandhill cranes, geese, nesting waterfowl and mule deer. Breeding waterfowl and cranes feed on early plant growth and invertebrates that live in the soil. To encourage growth of this nutritious food, the Refuge implements a haying program at the end of the summer as an effective and economic tool to remove old plants and recycle nutrients. After the meadows are hayed, they are irrigated to stimulate new plant growth. Some, but not all meadows are also grazed in late fall/early winter. Then in the following spring, the sun thaws the frozen soil of the meadows earlier, giving new plants a head start.

Private farmers who possess grandfather rights or who have successfully bid on haying a specific meadow are allowed to harvest hay on the Refuge under a Special Use Permit with conditions. The following table summarizes the harvest of hay in August of 2002 on the Refuge, as well as the last two years for comparison purposes.

Table 6: Summary of Haying Program at Modoc NWR from 2000-2002

Field	Tons of Hay		
	2000	2001	2002
Bailey	161	0	178
Front	741	470	849
Hamilton Tract	240	116	168
Heifer (plus a portion of Sandy Slough)	221	73	227
House	100	0	119
Pine Creek	463	0	499
South Pine Creek	238	126	262
Sharkey	721	205	417
Town (plus a portion of Sandy Slough)	285	0	350

9. Fire Management

a. Wildland Fire History

After the 1900's, human activities interrupted the natural fire frequency and patterns of burning. Livestock grazing reduced the light fuels that historically carried fires in the forests and interspersed meadows. Efforts to suppress naturally caused fires initiated in approximately 1906. At the same time, the effects of extensive livestock grazing were evident as the frequency of fires and the area burned decreased due to the loss of perennial grasses that provided the fine flash fuels.

Fire has been suppressed at Modoc National Wildlife Refuge since the early 1960's. Fire suppression and other land management practices have altered plant community structure and composition, artificially modified habitats and affected the historic/cultural scene. Fire suppression activities have unintentionally deprived the land of fire, which is necessary for the perpetuation of certain ecological processes. As a result, fire adapted communities within the refuge have been altered, potentially creating a decline in species composition and biological diversity. The restoration of fire to ecosystems is an important objective in managing the natural and cultural resources of the refuge.

b. Prescribed Fire

The Refuge has a history of using prescribed fire to manage habitats and enhance wildlife habitat. Accurate records have been kept since 1985. The Refuge conducted prescribed burns during 10 years from 1985 to 2001. The annual prescribed burned area ranged from 50 to 275 acres, with 1,554 total acres burned at the Refuge. Most of the acres burned were in marsh, pasture, or agricultural habitats. Past private land management practices have included burning agricultural ditches in portions of the refuge area. However, these practices were inconsistent with prior USFWS management policy and have been rarely utilized since.

The goals of the prescribed fire program are to:

- Restore/perpetuate native grasses, forbs, and shrubs;
- Reduce non-native plant species;
- Periodically reduce dense cattail and bulrush growth in wetlands to improve the ratio of open water to cover;
- Maintain/rejuvenate nesting cover for waterfowl and other native birds;
- Maintain water delivery systems; and
- Protect riparian habitats from catastrophic wildland fire events through the establishment of firebreaks.

Prescribed fires may be used to meet specific resource management or fire management objectives including, but not limited to, hazard fuel reduction, wildlife management, restoration of former grazing lands, debris removal, and control of non-native species, when applicable. Prescribed fire is an important management tool implemented to maintain fire adapted ecosystems such as wet meadow/grassland communities in a more productive early seral stage, which are better able to serve as nesting and feeding habitats. Prescribed fire is also an important management tool to help control noxious weeds such as perennial pepperweed, scotch thistle, Canada thistle, bull thistle and Mediterranean sage.

Implementing prescribed fire reduces high fuel loads, which left intact, could result in catastrophic wildfires that could negatively impact habitats within the refuge. In a severe wildfire, considerable riparian vegetation could be lost which could compromise the integrity of river bank and berm stability. Wildfires could also result in difficult-to-control organic soil fires, loss of seasonal nesting and foraging habitat, soil erosion, an increase in downstream sediment load and promote non-native plant infestations. Prescribed fire will also be used to reduce fuel loads along the refuge boundary-private lands interface, thereby reducing the potential liability of wildland fires spreading from public to private land.

Prescribed fire will be used as a complimentary management tool to other management actions to: reduce fuel loads, thus reducing the frequency and intensity of wildland fires; reduce weed infestations; increase native

plant abundance, composition and diversity; improve water delivery systems; and improve open water to plant cover ratios in wetlands. There is an ongoing need to ensure the perpetuation of fire dependent ecosystems and natural resources while managing wildland fire to provide protection of life, property and cultural resources.

No prescribed fires were conducted on Modoc National Wildlife Refuge in 2002 due to staff turnover and a required fire management plan. The Draft Modoc National Wildlife Refuge Fire Management Plan (FMP) was completed. A Final FMP will allow for prescribed fires on the Refuge in 2003.

c. Wildland Fire

The FWS has been recording wildland fire history at the Refuge since its establishment in 1960. The Refuge has had 12 recorded wildland fires in its 42-year history. One of those fires was caused by lightning and 11 were human-caused. A total of 71 acres of Refuge lands have burned due to wildland fire since the Refuge's establishment.

The neighboring Modoc National Forest (Modoc NF) has maintained fire history records since 1910. From 1980-1999, an average of 103 fires per year were recorded with 220 (11%) human caused and 1,848 (89%) lightning caused. Records from State, local and other Federal sources showed that wildland fire occurrence in the Upper Pit River Basin averaged more than 100 per year on approximately two million acres.

No wildland fires occurred on the Refuge in 2002.

10. Pest Control

A temporary employee, Carl Cox, was hired again this year from mid-April to early November to mainly combat noxious weeds at Modoc NWR. His main focus was on the continuing battle with Scotch thistle and perennial pepperweed, Class A noxious weeds in the State of California. The greatest increase in Scotch thistle infestation was noticed on the Grandma Field. All other infested sites remained the same as the previous year. Herbicides and hand removal were utilized to treat all noxious weeds.

Five new patches of pepperweed were found and treated. A total of seven pepperweed units were treated throughout the Refuge. A fall treatment of Canadian thistle was implemented this year across 16 units within the Refuge. Mediterranean sage was hand pulled in a unit near Goose Pond.

The South Grain Field was treated to reduce the amount of Canadian thistle and morning glory and increase grain production for the waterfowl.

In total, 211.2 gallons of herbicide was used for weed control on approximately 563 acres within the Refuge in 2002. Of the 563 treated acres, approximately 325 acres were farmed fields. The 211.2 gallons of herbicide includes 20 ounces of Rodeo, 6.5 gallons of Roundup and 197.75 gallons of Weedar 64, 6.5 gallons of Banvel, and 9.25 gallons of surfactant. The Refuge's battle against Scotch thistle continues on with this year's efforts only managing to maintain the current status, if not continue to lose ground to this problematic weed.

The Refuge continued to work with the Modoc County Department of Agriculture to manage weeds on the Refuge. In this cooperative program, the Refuge pays for half the costs of chemicals, equipment use and labor to control weeds on the Godfrey Tract. In the year 2002, the Refuge paid $532.75 to Modoc County for this service.

The State of California Department of Food and Agriculture, Plant health and Pest Prevention Services, Integrated Pest Control Branch continued to monitor a biological control program test plot of scotch thistle near Goose Pond. No results were reported in 2002.

11. Water Rights

Modoc NWR holds water rights on two creeks which drain from portions of the Warner Mountain watershed, east of the Refuge. The Refuge holds 52% of the total water rights within the Pine Creek irrigation district, the major water source for the Refuge. A significant water right is also held on Parker Creek. Diversions in the winter from these two creeks fill Dorris Reservoir, an 11,100 acre foot storage area. Stored water from the Reservoir is utilized in spring and summer to irrigate Refuge meadows and to maintain pond and marsh water levels.

Water rights for the Refuge and surrounding landowners are enforced through a Watermaster, employed by the State of California Department of Water Resources. For the 2004-2005 water year the State elected not to fund any of the Department of Water Resources, Watermaster Services division, from the General Fund. In the past they have covered 50% of watermaster services this way with the end user covering the other half. This change resulted in a more than tripling of the fees paid by the Refuge. What once cost us around $7,000 per year will now be closer to $25,000 per year. The total assessed amount for just the Pine Creek Irrigation district will be around $40,000, almost enough to cover the $45,000 annual salary of the watermaster, and we are just one of several districts covered by this watermaster. The new fees are even more interesting when you consider that we only receive watermaster services for 6 months of the year.

14. Farmers Home Administration Easements

Refuge staff and Dan Strait, FWS Private Lands representative from the California/Nevada Operations Office, visited the existing FMHA easements administered by the Refuge. An attempt was made to contact the current landowners and evaluate current management practices. Refuge staff and Dan

Strait also evaluated potential Partners projects on the Mokelstad and Chace properties.

15. Private Lands

Jeff Rose, Region 1 Private Lands engineer, and Shannon Ludwig surveyed the Mokelstad, Chace and Davis easement properties to submit as 2003 Partners projects. Jeff completed survey maps detailing enhancement and restoration plans for each parcel.

G. WILDLIFE

1. Wildlife Diversity

An abundance of wetland habitat, in combination with riparian areas, wet meadows and uplands on Modoc NWR support a high diversity of wildlife species in this high desert area. A total of 246 different bird species have been documented at Modoc NWR. Seventy-seven of these species have been found nesting on the Refuge and 17 more are suspected of nesting. The Refuge's habitat is an important nesting area for more than 76 species of ducks, geese, greater sandhill cranes and several other species of marsh birds. In addition, 53 different species of mammals and 19 different reptiles and amphibians are known to inhabit the Refuge.

2. Endangered and/or Threatened Species

Bald eagles (*Haliaeetus leucocephalus*) are the only Federally listed threatened and endangered species that are regularly found within the Refuge. Wintering bald eagles utilize the Refuge from October through March. Large cottonwoods and junipers near Dorris reservoir, Refuge Headquarters, and the Pit River provide eagle roosting and perching sites. Six bald eagles were observed in 2002.

Western snowy plovers (*Charadrius alexandrinus nivosus*), a Federally listed threatened species, are rare summer residents to the Refuge. Limited numbers of snowy plovers have been observed during early summer.

Yellow-billed cuckoo (*Coccyzus americanus*), a rare migrant and rare summer resident, is a Federal candidate species and is State listed as endangered.

Modoc sucker (*Catostomus microps*), a Federally listed threatened species, are not known to occur within waters of the Refuge (Reid pers. comm.)

Slender orcutt grass (*Orcuttia tenuis*), a federally listed threatened species, is not known to occur within the Refuge.

There are several species which are on the State of California Endangered, Threatened or Species of Concern List. The Central Valley population of greater sandhill cranes and the willow flycatcher are both listed as threatened by the State. See below for details on these species, their use of the Refuge and the Refuge's management practices in relation to these species in calendar year 2002.

3. Waterfowl

No waterfowl breeding surveys were conducted in 2002 due to staff turnover. General waterfowl population surveys were not conducted until August. Overall, the number of waterfowl utilizing the Refuge during summer and fall 2002 appeared to be normal with respect to previous years' population surveys. Fall populations peaked by late September through early October. Most waterfowl had left by mid-November due to several storms and freezes.

a. Ducks

As noted above, no waterfowl breeding surveys were conducted in 2002 due to staff turnover. Mallards with broods were noted as early as May with most fledged by early August. Broods of later nesting species, such as gadwalls, were observed as late as July with most fledged by late August. The estimated duck production for specific species on Modoc NWR for the past five years is detailed in Table 7.

During the fall migration of 2002, a large number of ducks migrated south onto the Refuge somewhat early in the season during mid to late September. After the opening of waterfowl hunting season on October 5th, the number of ducks on the Refuge slowly dropped due to harvest by hunters and the continued migration of the ducks. Throughout the remainder of the fall migration, no additional large groups of ducks moved onto the Refuge. As mentioned earlier, most waterfowl had left by mid-November due to several storms and freezes. Noted sightings this year included a male Eurasian wigeon.

Table 7. Estimated Breeding Pairs and Production at Modoc NWR from 1997 to 2002

Year	Species	Breeding Pairs	Total Production
1997	Mallard	546	636
	Gadwall	371	487
	Northern Pintail		
	Cinnamon Teal	118	145
	American Wigeon		
	Northern Shoveler	103	77

	Redhead	48	286
	Lesser Scaup	38	144
1998	No data available. Breeding pair count was not conducted due to staff turnover.		
1999	Mallard	315	1461
	Gadwall	249	1000
	Northern Pintail		
	Cinnamon Teal	73	247
	American Wigeon	32	156
	Northern Shoveler	89	432
	Redhead	44	195
	Lesser Scaup	48	165
2000	Mallard	315	1443
	Gadwall	249	986
	Northern Pintail	11	49
	Cinnamon Teal	73	246
	American Wigeon	32	155
	Northern Shoveler	89	432
	Redhead	44	191
	Lesser Scaup	48	164
2001	Mallard	482	1920
	Gadwall	401	1911
	Northern Pintail	4	15
	Cinnamon Teal	104	454
	American Wigeon	43	203
	Northern Shoveler	77	233
	Redhead	73	327
	Lesser Scaup	35	113
2002	No data available. Breeding pair count was not conducted due to staff turnover.		

b. *Geese*

In 2002, the Canada goose population surveys peaked on the Refuge at 1450 birds in December. Canada goose populations typically peak in February, but no surveys were completed due to staff turnover. Nesting Canada goose populations were below average this year. Goslings were noted as early as April on the Refuge. Table 8 describes Canada goose production on Modoc NWR from 1997 to 2002.

Table 8. Canada Goose Breeding Pairs and Production at Modoc NWR from 1997 to 2002

Year	Breeding Pairs	Production
1997	570	1782
1998	606	1430
1999	*	*
2000	*	*
2001	672	2236
2002	364	1325

* No data available. Breeding pair count was not conducted due to staff turnover.

Pacific Flyway geese usually do not migrate from the north to the Refuge until mid-November to mid-December when winter storms and cold temperatures push them south. In 2002, migrating Canada geese did not move into the Refuge until mid-December.

c. Swans

The ponds and other wetland habitats on Modoc NWR provide a staging area for tundra swans during migration with the highest numbers of swans observed in late winter and early spring. The peak number of tundra swans on the Refuge typically peak in February, but no surveys were completed due to staff turnover. There were 85 swans recorded on the refuge in a December, 2002 survey.

Three Trumpeter swans were recorded on Little Goose Pond in December, 2002 and were subsequently recorded throughout the remainder of the winter.

4. Marsh and Water Birds

Approximately 15 species of marsh and water birds used Modoc NWR during the year, including great blue herons, black-crowned night herons, great egrets, snowy egrets, greater sandhill cranes, American bitterns, pied-bill grebes, eared grebes, western grebes, Clark's grebes, white-faced ibis, American white pelicans, double-crested cormorants, Virginia rails and sora rails. Greater sandhill cranes, pied-billed grebes, eared grebe, western grebe, American bittern

and black-crowned night heron were documented nesting this year on the Refuge, but production data was determined only for the cranes.

The Pacific Flyway population of greater sandhill cranes is currently about 4,000 birds and is listed by the State of California as a threatened species. Modoc NWR is the most important nesting area in northeastern California for greater sandhill cranes, therefore, the Refuge places special emphasis on habitat management and data collection for this species. The Refuge supports 40 to 50 nesting pairs with an average recruitment (number of young surviving to adulthood) rate of 12 cranes year over a 20 year period. Greater sandhill cranes require wet meadows and wetlands to support their breeding and brood rearing efforts. A Modoc NWR telemetry study from 1990-1992 documented that wet meadow, irrigated pasture and marsh habitat comprised 77% of brood habitat. In certain tracts on the Refuge, nesting densities have been as high as 1 pair per 30 acres but more commonly 1 pair per 70-100 acres. Many of these birds also use adjacent areas off the Refuge to forage and feed their young.

Typically, breeding pair counts and nesting surveys of cranes are conducted during the spring, in late April to early May, but only limited counts were conducted due to staff turnover. Crane production and limited nest success surveys were conducted near the end of July to early September. Incomplete 2002 data result from a lack of complete breeding pairs and nests surveys. Table 9 summarizes the data collected for greater sandhill cranes at Modoc NWR from 1998 to 2002.

Table 9: Greater Sandhill Crane Production at Modoc NWR from 1998 to 2002

Year	Nesting Pairs	Nests Located	Successful Nests	Percent Successful	Colts Fledged	Percent Recruitment
1998	44	13	7	54%	14	16%
1999	44	13	7	54%	14	16%
2000	32	10	8	80%	20	31%
2001	34	19	10	53%	8	12%
2002*	n/a	12	7	58%	7	n/a

*****Limited surveys were conducted due to staff turnover

Crane banding operations were conducted from late July through September. Only three crane colts were captured by foot and banded in 2002. Refuge staff did not use rocket nets to attempt to capture and band adult cranes this year, a technique not used since 1992. The following table shows the number of cranes banded at Modoc NWR from 1998 to 2002.

Table 10: Crane Banding Data at Modoc NWR from 1998 to 2002

Year	Number of Cranes Banded
1998	11
1999	2
2000	1
2001	1
2002	3

5. Shorebirds, Gulls, Terns and Allied Species

Sandpipers, Wilson's phalaropes, greater yellowlegs, willets, dunlins, long-billed dowitchers, long-billed curlews, black-necked stilts, killdeer, common snipe, American avocets, Forster's terns, Caspian terns, ring-billed gulls and California gulls were all documented at the Refuge throughout the year. The Refuge provides shallow ponds and exposed mudflats which are favorite feeding areas for shorebirds and open water areas for gulls, terns and other species. The following species were documented as nesting on the Refuge, but no production data was formulated: long-billed curlews, killdeer, black-necked stilts and American avocets.

6. Raptors

A total of 15 species of raptors, owls and allied species (such as turkey vultures) were documented on the Refuge this year. Raptors who nested on the Refuge included American kestrels, great-horned owls, barn owls, short-eared owls, northern harriers and red-tailed hawks, although production data was not determined.

7. Other Migratory Birds

Small, but important, riparian areas on the Refuge provide nesting and forage areas for raptors, woodpeckers and neo-tropical migrants such as warblers, swallows, flycatchers and sparrows. Upland areas on the Refuge provide forage and nesting sites for California quail, ring-necked pheasants, waxwings, western

meadowlarks, sage thrashers, American robins, bluebirds, finches and other songbird species.

A mist netting project at Modoc NWR initially began in 1982 as a ten year study to monitor the breeding population of yellow warblers and willow flycatchers. After 1992, Refuge staff continued the mist netting project and began formally submitting data to Monitoring Avian Productivity and Survivorship (MAPS) detailing the various neotropical migrants captured. MAPS data are collected at various locations all over the United States by the Institute for Bird Populations in Point Reyes, California. The Refuge's MAPS station was not conducted in 2002 at the riparian habitat on the Refuge's Sub-headquarters unit because of staff turnover. Table 11 describes the data collected for the Refuge's MAPS station for the past five years.

Table 11: Monitoring Avian Population and Survival (MAPS) Station Data from 1998 to 2002

Year	Total Days of Operation	Total Net Hours	Birds per 100 Net Hours	Total Birds Captured	Total Number of Species
1998	9	no data	no data	265	no data
1999	9	no data	no data	305	no data
2000	8	448	no data	245	22
2001	8	448	no data	295	no data
2002	no data	no data	no data	no data	no data

8. Game Mammals

With the beginning of the year 2002 bringing a mild winter, the mule deer population continued to thrive finding plenty of forage areas and cover in the various habitats found on the Refuge. During the summer, mule deer were less common on the Refuge, as they headed to higher elevations for greener pastures. The mule deer returned to the Refuge in October as hunting season began, as well as when temperatures dropped and occasional snow showers began to blanket the ground.

10. Other Resident Wildlife

Other mammals observed on the Refuge this year include: black-tailed hare, Nuttall's cottontail, pygmy rabbit, Belding's ground squirrel, Beechey's ground squirrel, beaver, various gophers, various mice, muskrat, porcupine, coyote,

raccoon, mink, long-tailed weasel, badger, striped skunk, spotted skunk, river otter and bobcat. Other mammals are known to occur on the Refuge, but were not specifically observed this year, e.g., pronghorn antelope and mountain lion.

11. Fisheries Resources

The following fish species are known to occur within the various waters of Modoc NWR: Pit-Klamath brook lamprey, brown trout, rainbow trout, Goose Lake redband trout, Sacramento sucker, bluegill, green sunfish, largemouth bass, brown bullhead, channel catfish, hardhead, Pit roach, Sacramento squawfish, speckled dace, Tui chub and Pit sculpin. It is unknown how low water levels at Dorris Reservoir affected the fish population this year. Recreational fishing appeared to be normal for anglers who used the Reservoir. No restoration work for fishery resources was completed on the Refuge this year.

The Refuge staff applied for and received a $355,000 grant from the Cantara Trustee Council to build a fish passage device at the Refuge's main Parker Creek diversion structure in 2000. Unfortunately, new landowners were not interested in the project and the money returned to Cantara in 2002.

13. Surplus Animal Disposal

Over the past ten years, the Refuge has collected a large number of bird and mammal specimens. Those that were no longer needed in law enforcement cases, as well as those not needed by the Refuge, were disposed of or frozen for potential specimen display.

15. Animal Control

This year, the Refuge staff continued predator management through techniques such as trapping as a method to control predation of greater sandhill cranes. Management involved 4 coyotes and 5 striped skunks.

16. Marking and Banding

Refuge staff did not perform any waterfowl banding this year. As mentioned previously under the *Marsh and Water Birds* section of this report, greater sandhill crane banding operations were conducted from July through September with three juvenile cranes captured by foot and banded in 2002.

H. PUBLIC USE

1. General

Modoc NWR estimated visitation for the year was just shy of 40,000 visits. Recreational use at Dorris Reservoir, waterfowl hunting, and the auto tour route account for the lions share of these visits.

Retired California Department of Fish and Game Warden, Mike Wolter, conducted a Hunter Safety Certification class in September. Mike used the Refuge conference room for the classroom portion of the program. 8 students participated and were able to receive their certification in time for the Refuge Youth waterfowl hunt.

The Refuge issued 8 news releases on a variety of topics ranging from special events such as the Goose Roundup to WUI thinning of junipers at Dorris Reservoir.

2. Outdoor Classrooms – Students

2004 marked the inaugural year for the Pit River Adoption Project. The focus of this EE partnership, between the Refuge and the River Center, is to provide an outdoor learning lab where students from throughout Modoc County can come and participate in hands–on activities focused on the natural resources to be found in the watershed in which they live. In this first year over 400 students representing the entire K – 5 student body from the Alturas Elementary School took part.

As part of their first visit, each class will initiate some type of service activity which they will then continue with throughout their primary education years. Students will chose the type of service project they would like to undertake from a list provided by the Refuge. While these projects will all provide tangible benefits to the Refuge, the main focus is on building a sense of ownership in the students and providing something concrete that they can follow throughout their school career. The plan is to expand the program to include 6th graders in 2005 and phase in 7th through 12th grades in following years.

Refuge staff provided several guided tours and classroom presentations to school groups from outlying communities throughout the year.

4. Interpretive Foot Trails

The ADA accessible Wigeon Pond walking trail provides a nice opportunity for visitors to get out of their vehicles and take a different look at some of the wildlife and their habitat. The interpretive signage along this half mile trail provides the visitor with information on various wildlife species, habitats, and pre-settlement use of the area. This trail is a favorite for most of our school group tours.

5. Interpretive Tour Routes

The three mile Auto Tour Route continues to be a main source of recreational enjoyment for visitors to Modoc NWR. Numerous visitors enjoyed this route for wildlife observation as well as walking and jogging and, with sufficient snowfall, as a cross-country skiing route. This route provides a wonderful opportunity to view a variety of waterfowl, waterbirds, and shorebirds as well as bald eagles, sandhill cranes, and a host of other resident and migratory wildlife.

6. Interpretive Exhibits/Demonstrations

The Fifth Annual Modoc Migratory Bird Festival was held on September 10,11,12, 2004. This event, put on by the Modoc Migratory Bird Festival Committee, is a community-oriented wildlife festival which celebrates migratory birds and the natural environment by providing a fun and educational event for the public. Through workshops, exhibits and tours the festival highlights resident and migratory wildlife, their habitat and our interaction with these resources. The festival provides a wonderful opportunity for Refuge staff to interact with local citizens and provide outreach to 300-500 people. This year's festival included a Friday evening dinner and presentation by Jeanne Clark, author of "Americas Wildlife Refuges; Lands of Promise". The Saturday and Sunday events were well attended and festival goers were treated to workshops such as Landscaping for Wildlife, Greater sandhill crane biology, and duck banding along with the always popular birdhouse building and duck calling contest.

In addition to the Migratory Bird Festival, refuge staff participated in several other off-site events. RM Clay helped to staff the Modoc Noxious Weed Working Group booth at the Cedarville fair in August. This provides a great opportunity to talk to folks about the weed control efforts undertaken on the Refuge and combat the perception that the Refuge is the source of weeds for the entire county.

Refuge staff put together a booth for the Annual Children's Fair. The Children's Fair is a very well attended event and allows staff to interact with a large number of children and their parents.

The Refuge hosted an open house during Refuge week in October.

7. Other Interpretive Programs

In 2002 the local Resource Conservation District developed an Environmental Education Facility known as the River Center. The Refuge has been fortunate to have had an involvement in the development of this facility and its EE programs from the beginning. The goal of the River Center is to provide educational programs which emphasize the Pit River watershed and its resources while providing an orientation to and understanding of the role of the watershed to the areas school children, local citizens and the many visitors to the county.

The Refuge and River Center co-sponsored a number of special events throughout 2004. Among these were the Canada Goose roundup, Pit River cleanup day, and the Sandhill Crane workshop.

This was the first year for the Crane workshop which proved to be almost too successful with 100 plus people showing up on a Saturday to learn about Sandhill Cranes and view them up close on the Refuge. This event drew people from as far away as Redding and the Sacramento area.

Presentations were given to a number of local service organizations throughout the year regarding Refuge programs and activities.

8. Hunting

The 2004-2005 waterfowl season opened on the Refuge with all wetland units in very good shape and good concentrations of ducks and geese. Table 15 describes the dates and limits for the season:

Table 12: Regulations for the 2004-2005 Waterfowl Hunting Season for Northeast California

Waterfowl	Season	Limits	Details or Notes
Ducks	**10/9 to 1/9**	**7 daily, 14 in possession**	**Daily bag included the following: up to 5 mallards (but no more than 1 female), 1 pintail, 1 canvasback, 2 redheads, & 4 scaup**
Pintail	**10/9 to 12/7**		
Canvasback	**10/30 to 12/7** **12/20 to 1/9**		
Geese	**10/9 to 1/16**	**Total (white & dark): 3 daily, 6 in possession**	**Species Limits:** **Dark Geese (Canada, white-fronted & cackling): 2 daily - of which only 1 may be a cackling goose** **White Geese (Snow & Ross): 3 daily, 6 in possession**
Coot & Moorhen	**10/9 to 1/9**	**25 daily, 50 in possession**	**- -**
Snipe	**10/9 to 1/9**	**8 daily, 16 in possession**	**- -**

A full quota of 100 hunters were issued permits valid for both Saturday and Sunday of opening weekend. One hundred and four hunters (adults and juniors) showed up early Saturday morning and were rewarded with a great hunt. The Refuge posted a 5.72 average on Saturday and a 3.39 average on Sunday. The harvest tallied 907 ducks and 15 geese with mallard, gadwall, and green-winged teal making up the majority of the bag.

The Refuge held good numbers of ducks and geese throughout the season this year. Freezing weather started in late November at which time the duck harvest dropped significantly, even though enough birds stuck around throughout the season to keep it interesting. Goose hunting was slow overall and did not pick up markedly with the onset of hard freezing weather as in years past.

Hunt days went back to Tuesday, Thursday, Saturday this season, a change that was appreciated by most hunters as it allows them to hunt several different state and federal refuges in the area through the course of the week.

The following table summarizes the waterfowl harvest at Modoc NWR during the last three hunting seasons:

Table 16. Summary of harvest statistics for the past three hunt seasons at Modoc NWR.

Year	# of Hunters	# of Waterfowl Harvested per Hunter	# of Ducks Harvested per Hunter	# of Geese Harvested per Hunter
2002-2003	1,412	1.09	0.22	1321
2003-2004	1,475	1.59	0.19	2307
2004-2005	1,513	1.64	0.19	2333

The Junior Waterfowl Hunt took place on September 25th. Thirty-five young hunters participated and were treated to a barbecue and orientation on Friday evening. The hunt provided a great experience for the juniors and their adult chaperones. The harvest for the day was 164 ducks and 16 geese for a 4.69 birds per hunter average. Support for the event was generously provided by the California Waterfowl Association and Ducks Unlimited.

9. Fishing

Public fishing is allowed at Dorris Reservoir. The reservoir is located within 5 miles of the town of Alturas and as such is a very popular fishing spot for local anglers. The fishing for largemouth bass, channel catfish, crappie, and rainbow trout can be very good. Fishing is permitted during daylight hours except during waterfowl hunting season (usually October through January when the reservoir is closed to all public access). The reservoir was full to capacity going into the fishing season and the fishermen showed up in good numbers once the weather warmed up in June. The fishing for bass and crappie was reported to be quite good during the latter part of the season.

Refuge staff met with a newly formed fishing group wishing to have the South boat ramp kept open for an extra hour in the evening. This change would allow boat fishermen to fish until sunset and still have time to get off the water before the gates are closed. Several issues will need to be worked out before this can occur, most importantly is potential impacts to wildlife use of the reservoir. During the 2005 fishing season the Refuge biologist will monitor bird use of the reservoir during the extra hour after sunset for possible impacts that could be created by this request.

11. Wildlife Observation

It was estimated that approximately 48,239 visitors utilized Modoc NWR for wildlife observation in the year 2002. Wildlife observation at the Refuge focuses on waterfowl and other marsh birds as observed from the Auto Tour Route around Teal Pond. Visitors from the local area also enjoy the mule deer and raptors that frequent the Refuge. A large number of out-of-town visitors continue to find this small, isolated Refuge to not only observe water birds and (especially nesting greater sandhill cranes), but to also enjoy raptors and songbirds. This latter phenomenon is consistent with what is occurring all across the country, as birders seek new and interesting locations to see a variety of birds. The Refuge still does not receive the amount of visitors that other National Wildlife Refuges see each year, but Refuge staff continue to hear that the Refuge is a nice stop as visitors make their way to or from Reno, Redding, Bend or other National Wildlife Refuges in the area.

12. Other Wildlife Oriented Recreation

Wildlife photography continued to be a popular means of recreation at Modoc NWR. Due to the scenic beauty of the area with the Warner Mountains as a backdrop, as well as the variety of wildlife that frequents the Refuge's wetland habitats, many photographers stopped at the Refuge to capture waterfowl, greater sandhill cranes and mule deer on film. Refuge vistas and wildlife graced the pages of the Modoc County Record on many occasions throughout the year.

16. Other Non-Wildlife Oriented Recreation

Water skiing, boating, swimming and picnicking all occurred at Dorris Reservoir during the summer. While water skiing is still a permitted use it occurs very infrequently.

The use of the Refuge auto tour route for jogging and walking continues to be a popular activity.

17. Law Enforcement

Following what seems to be a national trend, the Modoc NWR now finds itself without any LE staff. Refuge staff continue to keep an eye out for problems and make the appropriate contacts.

18. Cooperating Associations

2004 saw the start of " Friends of Modoc Refuge". The group is currently comprised of nearly a dozen individuals who are in the process of applying for their tax-exempt status. Several small projects including the construction of a photo blind are already being discussed. The refuge welcomes this new addition to our family.

I. EQUIPMENT AND FACILITIES

1. New Construction

Thanks to the efforts of the YCC crew another handicap hunt blind was constructed this year. The blind was made large enough to accommodate two wheel-chaired hunters. The blind was constructed of pressure treated wood and plastic lumber, and covered with fastgrass matting.

The industrious YCC crew and their fearless leader

2. Rehabilitation

Annual rehabilitation by Refuge staff occurred in the year 2004, mostly involving the repair and maintenance of dikes, levees and water control structures that had received routine damage from the weather and wildlife (specifically muskrats, beavers and ground squirrels). Additionally, several large rehabilitation projects were completed by Refuge staff in 2004. These included dike and island maintenance in Little Goose pond and Railroad pond.

All of the tall islands were knocked down in elevation and re-sloped while others were combined to make larger irregular shaped islands. All islands now do not exceed more than a foot and half above the max water level. Hay bales were used as wave barriers to protect the islands from wave erosion until vegetation establishes.

Parts of the barrow ditch which was created when the Little Goose pond dike was originally built was filled in to within a foot and a half below the pond surface. Part of the dike was rebuilt to eliminate cut-bank caused by wave erosion.

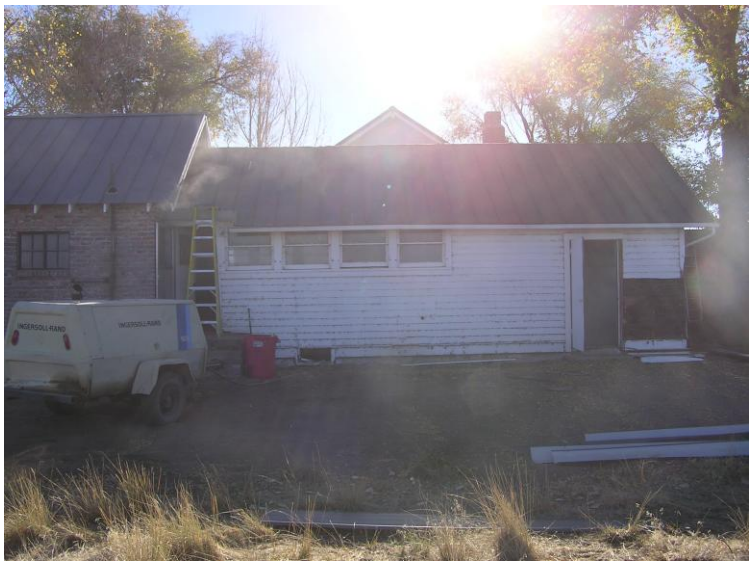
In railroad pond more of the old large islands were removed. The material from the islands was use to fill in an old ditch and build an access road to the new accessible hunt blind in Railroad pond.

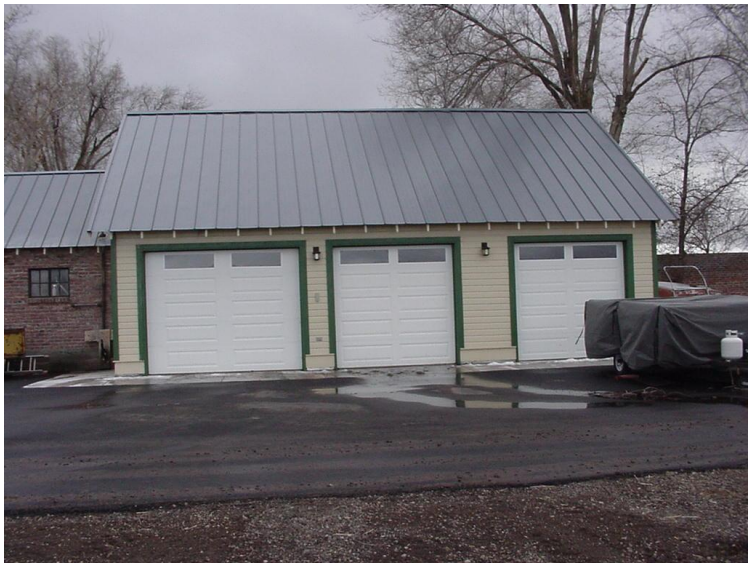
3. Major Maintenance

Quarters 14 rehab, begun in 2003 was completed this year. Work included the removal of dilapidated portions of the house and replacing those with a garage, insulating the walls and attic space of the house, install new windows and doors, air conditioning, and bring the electrical wiring up to code.

The final touch was painting the house. This work was preformed under contract.

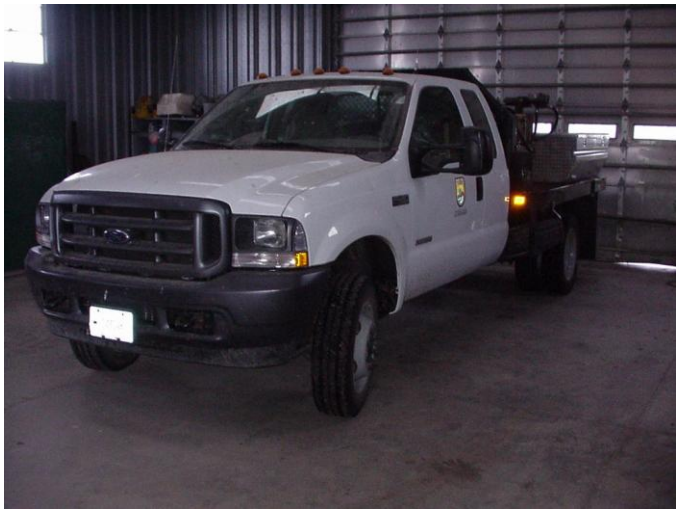
Additional work completed by force account on the house was installing a new tub/shower in the downstairs bathroom, rerouting the sewer line around the new garage and plumbing in the sink and hot water heater in the garage.

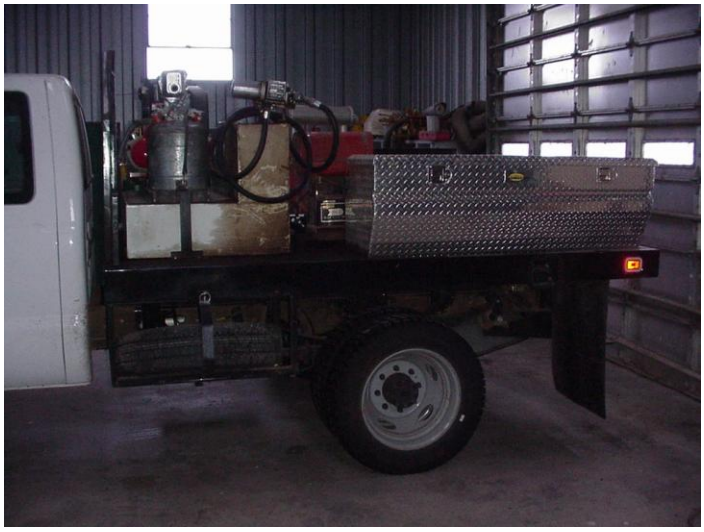


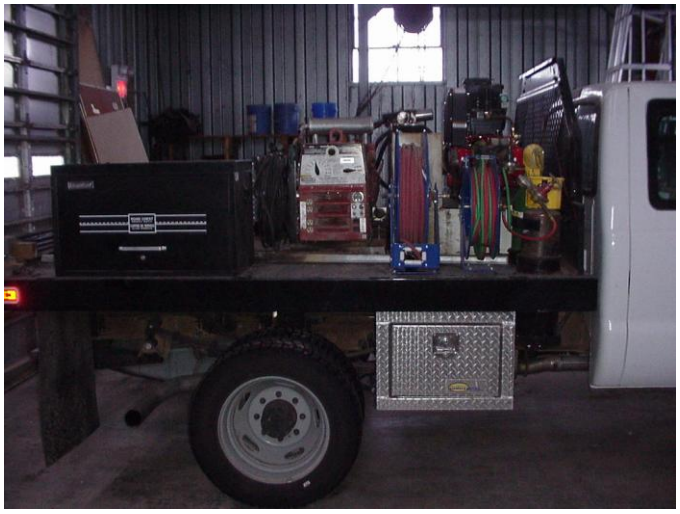


4. Equipment Utilization and Replacement

The 1980's three-quarter ton pickup which had been used as a service truck was replaced this year. An "extra" 2004 Ford F450 was purchased from the Sheldon/Hart Mountain NWRC and was outfitted with tool boxes, oxygen and acetylene hoses and tanks, new air hose and reel, generator/arc welder and pony fuel tank, and gas operated air compressor. A spare tire holder was fabricated and fitted on the underside of the flatbed on drivers side. WG staff are now setup for everything from welding to full service in the field with this mobile beast!!!







8. Other

This year with the equipment rental funds we rented a vibrating sheep's foot roller for the dike work that was done on the heifer dike and railroad pond dike. Also with the rental funds, a semi tractor, belly dump trailer and driver was rented to haul gravel on the railroad pond dike.

J. OTHER ITEMS

1. Cooperative Programs

a. Modoc County Noxious Weed Working Group

The Refuge continued to host meetings and participate in the Modoc County Noxious Weed Working Group.

b. National Audubon Society - Christmas Bird Count

The Christmas Bird Count was conducted in December, 2002 by two separate groups totaling four people. Fifteen participants were originally signed up for the event, but inclement weather kept them from participating.

4. Credits

To compile specific information for the calendar year 2004, various Refuge documents and reports were used, in addition to the contributions of the entire staff:

Steve Clay	Final Review , A, C, D, E , H, I.1, 2,5, J
Shannon Ludwig	A, B, C. 4, D.5, E. 2,4,7, F, G, H.8
Alicia Winters	Final Review, Editing, E.5
Greg Albertson	F.11, I
Bradley Storm	F.4, 10, I
Carl Cox	F.10, I

K. FEEDBACK